

Remarks

Status of the Claims

By this Amendment, claims 1, 8, 15, 17, 18, 22, 29, and 36 are amended and claim 16 is canceled, leaving claims 2-4, 6, 9, 11-13, 20, 23, 25-27, 30-32, 34, 37, and 39-41 unchanged. Claims 5, 7, 10, 14, 19, 21, 24, 28, 33, 35, 38, and 42 were withdrawn in a previous Office Action. The Applicant respectfully requests reconsideration and allowance of pending claims 1-4, 6, 8, 9, 11-13, 15, 17-18, 20, 22, 23, 25-27, 29-32, 34, 36, 37, and 39-41.

Claim Objections

On page 2 of the Office Action, Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 16 is hereby canceled, and claims 17 and 18 are hereby amended to provide proper claim dependency. Accordingly, the Applicant respectfully requests withdrawal of the objection to claim 16.

Claim Rejections

35 U.S.C. § 112, second paragraph

On pages 2 and 3 of the Office Action, claims 8 and 36 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

The Applicant hereby amends claims 8, 22 and 36 to more particularly point out the range of the claimed invention. Accordingly, the Applicant respectfully requests withdrawal of the 35 U.S.C. § 112, second paragraph, rejection of claims 8 and 36.

35 U.S.C. § 102(b) Rejections

On page 3 of the Office action, claims 1, 8, 12, 29, 36 and 40 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Number 3,865,185 (“Ostbo”). Also, on pages 3 and 4 of the Office Action, claims 1, 8, 9, 12, 29, 36, 37 and 40 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Number 5,464,056 (“Tajima et al.”)

Claim 1 is hereby amended, and calls for:

A stacked plate heat exchanger for transferring heat between at least a first fluid and a second fluid, the heat exchanger comprising:

a plurality of stacked plates having substantially the same shape, and comprising:

a first end plate having at least one fluid connector drawn from and arranged on the first end plate, the connector having a first cross sectional plane located at a first port of the connector and a second cross sectional plane located at a second port of the connector, the first and second planes forming an acute angle relative to each other;

a second end plate located opposite the first end plate;

at least one intermediate plate sandwiched between the end plates to provide a surface area for transferring heat between the first and second fluids; and

a fluid line attached to the connector at the second port to direct one of the first and second fluids between the connector and a component other than the connector.
(Amendment marks not shown).

Claim 29 is also hereby amended, and calls for:

A stacked plate heat exchanger for transferring heat between at least a first fluid and a second fluid, the heat exchanger comprising:

a plurality of stacked plates having substantially the same shape, and comprising:

a first end plate having at least one fluid connector drawn from and arranged on the first end plate, the connector having a first cross sectional plane located at a first port of the connector and a second cross sectional plane located at a second port of the connector, the first and second planes forming an acute angle relative to each other;

a second end plate located opposite the first end plate;

a stack of intermediate plates sandwiched between the end plates to provide surface areas for transferring heat between the first and second fluids;

a plurality of fluid manifolds in said intermediate plates to direct the first and second fluids to said surface areas; and

a fluid line attached to the connector at the second port to direct one of the first and second fluids between the heat exchanger and a component other than the heat exchanger. (Amendment marks not shown).

In contrast, Ostbo discloses a plate heat exchanger consisting of a generally cylindrical shell jacket 1 with an inlet 2 and outlet 3, wherein the shell jacket 1 encloses several metal discs 8 arranged in an axial direction (col. 1, lines 56-63 of Ostbo), and wherein the shell is not a part of the metal discs 8, but rather encloses the metal discs 8 (see Fig. 1 of Ostbo). Also in contrast, Tajima et al. disclose a housingless oil cooler having an upper tank 111 with holes 111A and 111B, an inlet tank chamber 125, a lower plate 101, and a number of plates 3, 5 therebetween, wherein the lower plate 101 and the element defining the upper tank 111 are substantially different from the interior plates 3, 5. Accordingly, Ostbo and Tajima et al. both fail to teach, describe, or suggest, among other things, a plurality of stacked plates having substantially the same shape, and comprising: a first end plate having at least one fluid connector drawn from and arranged on the first end plate, and having an acute angle between cross-sectional planes at ports of the connector as claimed, a second end plate, a stack of intermediate plates between the end plates, and a fluid line attached to the connector at a port to direct a fluid between the connector or heat exchanger and another component as claimed in amended claims 1 and 29.

For these and other reasons, the Applicant respectfully submits that claims 1 and 29 are novel and patentable over Ostbo and Tajima et al. Claims 8, 9, and 12, and claims 36, 37 and 40 are each dependent upon amended independent claims 1 and 29, respectively, and are allowable based upon amended independent claims 1 and 29 and upon other features and elements claimed in claims 8, 9, 12, 36, 37, and 40 but not discussed herein. Accordingly, the Applicant respectfully requests withdrawal of the 35 U.S.C. §102(b) rejection of claims 1, 8, 9, 12, 29, 36, 37, and 40.

35 U.S.C. § 103(a) Rejections

On pages 4-5 of the Office action, claims 2-4, 6, 9, 15-18, 20, 23, 30-32, 34 and 37 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ostbo in view of U.S. Patent Number 3,240,268 (“Armes”).

Claim 15 is hereby amended, and calls for:

A stacked plate heat exchanger for transferring heat between a first fluid and a second fluid, the heat exchanger comprising:

a plurality of stacked plates having substantially the same shape, and comprising:

a first end plate having at least one fluid connector drawn from and arranged on the first end plate, the connector having a first cross sectional plane located at a first port of the connector and a second cross sectional plane located at a second port of the connector, the first and second planes forming an acute angle relative to each other;

a second end plate located opposite the first end plate; at least one intermediate plate sandwiched between the end plates to provide a surface area for transferring heat between the first and second fluid; and

a fluid line attached to the connector at the second port located at least partially above and extending over the first end plate to direct one of the first and second fluids between the connector and a component other than the connector. (Amendment marks not shown).

In contrast, and as discussed above in connection with amended claims 1 and 29, Ostbo discloses a plate heat exchanger consisting of a generally cylindrical shell jacket 1 with an inlet 2 and outlet 3, wherein the shell jacket 1 encloses several metal discs 8 arranged in an axial direction (col. 1, lines 56-63 of Ostbo), and wherein the shell is not a part of the metal discs 8, but rather encloses the metal discs 8 (see Fig. 1 of Ostbo). Armes fails to cure the deficiencies of Ostbo, teaching only a stacked caseless heat exchanger in which each of the thin metal plates 16, 18, and 20 defining the core of the heat exchanger is formed with flat peripheral flanges or margins 22, wherein openings 24, 26, 29, 30 (col. 1, lines 52-54 of Armes) provide fluid flow through the plates 16, 18, 20.

The Applicant also notes that limitations exist regarding the reasonable combination of features taught by Ostbo and Armes, based at least in part upon the significantly different types of heat exchangers disclosed by Ostbo and Armes. In particular, many of the teachings regarding housing-based heat exchangers as disclosed by Ostbo are incompatible with teachings

regarding housingless heat exchangers such as those disclosed by Armes. Accordingly, the Applicant respectfully submits that Ostbo cannot fairly be combined with Armes as suggested on pages 4 and 5 of the Office Action. In addition to the fact that Ostbo discloses a heat exchanger having a shell; whereas the Armes heat exchanger is housingless, the heat exchanger of Ostbo would lose the functionality gained by the use and placement of inner and outer chambers 21, 22, 23, 24 if the shell 1 of Ostbo was essentially collapsed onto the metal discs 8 (to enable the incorporation of teachings from Armes). Therefore, the Applicant respectfully submits that one of ordinary skill in the art would not look to Armes for modification of the Ostbo heat exchanger in order to arrive at the present invention as claimed in amended claim 15. To incorporate the teachings of Armes into Ostbo would destroy important features and functionality of Ostbo.

In summary, neither Ostbo nor Armes, alone or in combination, teach, describe, or suggest all of the features and elements of amended independent claim 15. Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection of amended independent claim 15 is respectfully requested. Claims 2-4, 6, and 9, claims 16-18, 20 and 23, and claims 30-32, 34, and 37 are each ultimately dependent upon amended independent claims 1, 15, and 29, and are allowable based upon amended independent claims 1, 15, and 29 and upon other features and elements claimed in claims 2-4, 6, 9, 16-18, 20, 23, 30-32, 34, and 37 but not discussed herein. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 2-4, 6, 9, 16-18, 20, 23, 30-32, 34, and 37 is therefore respectfully requested.

On pages 4-6 of the Office Action, claims 11, 13, 25, 27, 39 and 41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ostbo in view of U.S. Patent Number 3,690,373 (“Wright”).

Claims 11 and 13, claims 25 and 29, and claims 39 and 41 are each ultimately dependent upon amended independent claims 1, 15, and 29, and are allowable based upon amended independent claims 1, 15, and 29 and upon other features and elements claimed in claims 11, 13, 25, 29, 39, and 41 but not discussed herein. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 11, 13, 25, 29, 39, and 41 is therefore respectfully requested.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the claims of the present application are in condition for allowance. The Applicant requests that the Examiner telephone the attorneys of record in the event a telephone discussion would be helpful in advancing the prosecution of the present application.

Respectfully submitted,



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